Engineering ellipsoidal cap-like hydrogel particles as building blocks or sacrificial templates for three-dimensional cell culture

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Supplementary Figure 1. Hydrogel particles generated on AAO membranes by using a pressure assisted and value-based bioprinting system. The bioprinting system has been described in our recent published work.\textsuperscript{1} It enables high-throughput generation of hydrogel sol droplets. As the preliminary experimental result, the figure shows that small hydrogel particles at the size of 100–200 μm were generated when the valve-opening duration was 100 μs. Larger particles could be easily generated by increasing the time of valve-opening duration. Scale bar: 100 μm.

Supplementary Figure 2. H\textsubscript{2}O\textsubscript{2} rapidly diffused through the AAO membrane. (a) The standard curve of known concentration of H\textsubscript{2}O\textsubscript{2}-titanium complex absorbance at 412 nm measured via titanium sulfate colorimetry. The horizontal axis represents the known concentration of measured H\textsubscript{2}O\textsubscript{2}. The red line is a linear
fitting curve with a slope of 0.1739. (b) Measured H$_2$O$_2$-titanium complex absorbance at 412 nm as a function of time of H$_2$O$_2$ diffused through the AAO membrane. (c) The derived average concentration of H$_2$O$_2$ in hanging droplets as a function of diffusion time.

Supplementary Figure 3. Representative live/dead images. (a) A representative image of live cells post-encapsulation; (b) A representative image of dead cells post-encapsulation; (c) A representative image of live cells after cultured for 3 days in a magnetic alginate particle; (d) A representative image of dead cells after cultured for 3 days in a magnetic alginate particle. Scale bar: 500 μm.

References